Worksheet: Ray Optics and Optical Instruments

ISC · Class 12 · Physics · 10 questions · 30 marks

Name: _____ Date: _____ Score: _____ / 30

Q1. An object is placed 20 cm in front of a concave mirror of focal length 10 cm. Find the image distance and state its nature. *[2 marks]*

Q2. Find the critical angle for a glass-air interface if the refractive index of glass is 1.5. *[2 marks]*

Q3. A convex lens of focal length 25 cm is placed in contact with a concave lens of focal length 50 cm. Find the power of the combination. *[2 marks]*

Q4. A double convex lens of refractive index 1.5 has both radii equal to 20 cm. Find its focal length. *[3 marks]*

Q5. A coin lies at the bottom of a vessel containing 16 cm of a liquid of refractive index 1.6. Find its apparent depth and the apparent shift. *[3 marks]*

Q6. A prism of refracting angle 60 degrees gives a minimum deviation of 30 degrees. Find the refractive index of its material. *[3 marks]*

Q7. A magnifying glass has focal length 5 cm. Find its magnifying power when the image is formed at infinity and when it is formed at the near point. *[3 marks]*

Q8. A compound microscope has an objective of focal length 1.0 cm and an eyepiece of focal length 5.0 cm. The object is 1.1 cm from the objective and the final image is at 25 cm. Find the magnifying power. *[4 marks]*

Q9. A telescope has an objective of focal length 100 cm and an eyepiece of focal length 4.0 cm. Find its magnifying power in normal adjustment and the tube length. *[4 marks]*

Q10. Show, using the mirror equation, that a convex mirror always forms a virtual image that is diminished and lies between the pole and the focus. *[4 marks]*